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Discussion Paper No. 36

THE EFFECTS OF ELEMENTARY SCHOOL QUALITY ON
SECONDARY SCHOOL ACHIEVEMENT

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THE EFFECTS OF ELEMENTARY SCHOOL QUALITY ON
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This paper is a chapter from a monograph, to be published shortly, on the efficiency of present methods of selection for entry to secondary school in Uganda. The sample studied consists of 881 pupils, making up about 95% of the African candidates who sat the selection examination (Junior Secondary Leaving Examination, or JSLE) in 1960, and the Cambridge Overseas School Certificate Examination (CSC) in 1964. In other chapters, relationships between performance in the two examinations are analysed, and various possibilities for improving selection discussed.

The CSC marking system works in the opposite direction to most marking systems: a low grade aggregate indicates good performance, and a high grade aggregate poor performance.

There is one further possibility for improving the effectiveness of senior secondary selection which can be explored with the data available. Some junior secondary schools are much more successful in the JSLE than others. In most years as many as half the pupils from some junior secondary schools are accepted for senior secondary education, while from other schools no pupils are accepted. This suggests that the mark a candidate obtains in the JSLE depends largely on the quality of the junior secondary school he has attended. If this is so, a pupil from a school where teaching has been poor should have better academic potential than a pupil with the same mark from a more successful school. It thus seems possible that selection could be improved if junior secondary school quality were taken into account, particularly when selecting among borderline candidates.

To some extent, of course, these variations in average JSLE performance among schools are due to differences in the pupils rather than to differences in the quality of education. The most important reason for pupil-differences is likely to be previous selection. Some junior secondary schools are better known than others, or have the reputation of being more successful, and hence can be more selective in choosing entrants from primary schools. A few schools receive applications from as many as three or four primary leavers for every place, while others have unfilled places. Previous achievement, however, is not always the only criterion for selection. Many junior secondary schools tend to give preference to pupils from their own primary section, or from an associated primary school, and, until recently, religious denomination was an important factor. From the limited data available it seems that there is only a moderate relationship between the extent to which a school selects its entrants and its average performance in the JSLE.

The pupils in different junior secondary schools may vary in other ways which may be relevant for JSLE performance. In some schools, for example, they may tend to have better health, or to be more highly motivated, than in other schools, particularly when different districts are being compared.

In developed countries, an important reason for inter-school differences in academic performance is variation in the socioeconomic status of the families from which the pupils come. This is much less significant in Uganda, where in most rural and peri-urban elementary schools the majority of pupils are the sons of small farmers. Until recently, few African pupils attended urban elementary schools. In any case, results from another project at present being completed by the writer indicate that in Uganda low socioeconomic status is not consistently correlated with poor academic achievement, as it is in Britain and America.

Although differences between pupils undoubtedly contribute to the inter-school variations in average JSLE performance, differences in standards of teaching and equipment are probably much more important. Elementary schools in Uganda are remarkably uneven in quality. This can be illustrated by some data from the project just mentioned. The sample for this project included three junior secondary schools

in a relatively prosperous coffee growing district of Uganda. The schools were all within the same county, and all within twenty miles of each other. They were all day schools in rural areas, and all drew most of their pupils from the surrounding villages. More than two thirds of the pupils in each school were the sons of small coffee growers. Despite these similarities, the schools varied widely in their examination achievement. The most successful school had an average total mark of 112 in the 1963 JSLE, the least successful 66, and the remaining school 101. The range is nearly $1\frac{1}{2}$ standard deviations. The differences cannot be accounted for by previous selection. The best and the poorest schools were both non-selective; each selected 40 entrants from 50-60 applicants, mostly from their own primary sections. The middle school was more selective, accepting 80 entrants from 200-250 applicants, probably because it was the oldest and best known school in the area. It is virtually certain that the variations in examination performance are due almost entirely to differences in the quality of the education offered at the three schools. Some possible reasons for these quality variations will be discussed later in the chapter.¹

The significance of school quality for JSLE success can be further illustrated by data from the Karamoja district of Uganda. Most of the people in this semi-arid district are cattle-keepers, although they also grow subsistence food crops. In some areas where the rainfall is higher, cattle are less important, and cotton growing has become popular. Nearly all the pupils at the three junior secondary schools in the district are boarders. The schools are all non-selective; in fact, in order to fill their available places, they all draw 40-50% of their entrants from outside the district, mainly from cotton-growing areas

¹ Because the sample for this project consisted of less than 20% of the junior secondary schools in the district, most of the schools visited were widely scattered and hence not as closely matched as these three. If all schools in a more restricted area had been visited, it is highly probable that similar variations in JSLE performance in larger groups of matched schools could have been demonstrated.

in the neighbouring districts of Teso and Acholi. Nevertheless, the schools are not as closely matched as those just discussed. In one school the proportion of pupils from predominantly pastoral groups is as high as 49%, while in the other two schools it is only 27% and 18%. There is no evidence, however, that the pupils from pastoral backgrounds are any more successful in the JSLE than those whose families are mainly cultivators, or vice versa, so these differences are unlikely to have any marked effect on the inter-school variations in examination performance.

Table XIII: Karamoja Mean JSLE Marks and Reasoning Scores

School	Mean Mark, 1964 JSLE	Reasoning Tests	
		Non-verbal (Ravens)	Verbal (Analogies)
School 1	139.0	25.87	10.00
School 2	112.2	22.68	8.77
School 3	105.4	27.22	9.87
Total sample:			
Mean	115.43	26.27	9.72
S.D.	33.85	9.77	2.36

Table XIII gives the mean scores obtained by pupils in the three schools in (a) the 1964 JSLE, (b) a non-verbal reasoning test (Raven's Progressive Matrices) and (c) a verbal reasoning test (a specially devised analogies test, using only words familiar to eighth year pupils). It will be seen that there are wide differences among classes in average JSLE performance. The most successful class has a mean mark about one standard deviation higher than the least successful. These differences in achievement, however, are not paralleled by differences in measured reasoning

ability. In the verbal reasoning test, the pupils from the least successful school obtain only marginally lower scores than the pupils from the most successful school, while in the non-verbal reasoning test, the least successful school has the highest mean score. There can be little doubt that the variations in JSLE achievement among these three schools are due for the most part to differences in teaching efficiency, and not to differences in the intellectual aptitude of the pupils.

The next step was to devise a measure of junior secondary school quality for our main sample. This was derived from the marks obtained in each school by all pupils who sat JSLE, in the Mathematics and English Language papers. Comprehension and Essay marks could not be used, because records were incomplete. The Mathematics and Language means for each school were totalled, and the composite mean was treated as a junior secondary school quality score for all pupils from that school. For those pupils who were selected for senior secondary entrance, the JSS quality scores ranged from 56 to 135, with a mean of 103.72 and a standard deviation of 16.48. It should be remembered that these quality scores are, of course, to some extent contaminated by the effects of previous selection and other non-quality factors.

The multiple regression analysis for CSC grade aggregate discussed in the previous chapter was then repeated, but with the addition of JSS quality as a fifth independent variable. It may be recalled that the two main purposes of this analysis were to determine firstly, how the four JSLE papers should be weighted to give maximum prediction of the school certificate result, and, secondly, what the multiple correlation between the JSLE total mark and CSC grade aggregate would be, given optimum weighting of the JSLE papers. From the data we have just discussed it was anticipated that JSS quality would enter the regression equation with a negative coefficient, and that the multiple correlation would increase substantially. If such a result were found, it would indicate that secondary school entrants from low-quality junior secondary schools, with their relatively

high but underexploited intellectual potential, tended to be more successful in the school certificate examination than pupils with the same selection marks from better schools. That is, pupils from poor schools whose performance in the JSLE was well below what they were capable of, made good some of their handicap when they got to senior secondary school and reached a level of performance more in keeping with their intellectual potential. Such findings would have suggested that selection could be improved by taking account of JSS quality, giving preference, when choosing among pupils with similar marks, to those from poorer schools.

It was found, however, that the inclusion of JSS quality in the multiple regression equation had virtually no effect on the level of CSC prediction. The standard regression (beta) coefficient for JSS quality was only one-fifth as large as the coefficient for English Essay, the weakest JSLE predictor, and it was positive rather than negative in sign. The increase in the multiple correlation was infinitesimal - from .3804 to .3807.

These results established clearly that the JSS quality scores could not improve CSC prediction, at least over the full selected sample. Nevertheless there still seemed a chance that the school quality scores might be useful in selecting borderline candidates. To check on this possibility, mean CSC grade aggregates were calculated for pupils according to their total JSLE marks and JSS quality scores. These means are set out in Table XIV. The JSS quality scores are divided into three categories. The "high quality" category consists of 211 boys from schools with quality scores of 114 and over, the "medium quality" category of 356 boys from schools between 94 and 113, and the "low quality" category of 198 boys from schools where the quality score was 93 or lower.¹

¹ The cutoff points were placed as close as possible to the 27th and 73rd percentiles. This is the most efficient way of dividing a distribution into three parts (Flanagan, 1952).

Table XIV: Mean CSC grade aggregate by JSLE total mark and JSS quality

JSS quality	JSLE total mark						
	148-157	158-167	168-177	178-187	188-197	198-207	208-217
High (114+)	(34.50)	35.16	31.36	28.33	28.30	28.68	23.68
Medium (94-113)	33.97	32.03	32.18	26.86	25.48	26.10	-
Low (- 93)	33.54	35.62	30.74	29.88	27.17	22.90	(18.50)

Means based on subsamples of 5-9 are bracketed; where n is below 5 no mean is given.

It can be seen at once that among borderline candidates the quality of the junior secondary school makes no difference to the school certificate result. Boys with JSLE marks between 148 and 157 were very slightly more successful if they came from low-quality schools, but this trend is reversed among those with marks between 158 and 167. At the other end of the JSLE scale, however, the differences are in the expected direction, although they are not large enough to be statistically significant. Among the handful of pupils from inferior schools who succeeded in obtaining very high marks in the selection exam, thus transcending the effects of poor teaching and lack of competition from classmates, school certificate performance is rather better than it is among pupils from superior schools with similar JSLE marks. The 16 pupils from low-quality schools with JSLE marks between 198 and 217 (the two top categories) have a mean CSC grade aggregate of 21.25, as compared with only 26.50 for the 39 pupils from high-quality schools with JSLE marks in the same range. Over the rest of the JSLE scale, however, junior secondary school quality is quite unimportant in determining school certificate performance.

A possible explanation for these unexpected results might be that boys from low-quality junior secondary schools tend to get poorer senior secondary education than boys from high-quality schools with the same selection exam marks. This might happen if headmasters of the better known and more popular senior schools tend to give preference to candidates from the more successful junior schools, when choosing among pupils with similar marks. We therefore examined the relationship between the quality of the junior secondary school a pupil comes from and the quality of the senior secondary school he enters. To determine senior secondary quality, a graph was prepared plotting, for each school, the average JSLE mark obtained by the 1961 intake against the average CSC grade aggregate obtained by the same pupils at the end of their senior secondary course in 1964. These points were then compared with the smoothed regression of CSC grade aggregate on JSLE total mark for the full sample. This gave us a measure of the change in achievement of the pupils in each senior school between the selection examination and school certificate relative to the full sample, and provided a more sophisticated measure of senior secondary quality than had been available for the junior secondary schools. It was found that the 21 schools grouped themselves rather conveniently into three categories:

- (a) For seven schools, the mean CSC grade aggregate was at least 2½ points better than might have been expected from a knowledge of the average mark obtained by the pupils in the JSLE, and of the relationship between JSLE total mark and CSC grade aggregate in the full sample. These schools were classified as being of high quality. In one such school, for example, the mean JSLE mark of the 1961 intake was 172.2, which is a little below the full sample mean of 176.08. Judging from the CSC regression line, we should expect these pupils to average about 31.0 in school certificate, about one point below the sample mean (30.03). In fact, however, their CSC mean was as high as 25.2, or nearly five points better than the sample mean, so that their achievement status, relative to the status of pupils in other schools, improved considerably over the four years of their senior secondary education.
- (b) For another six schools, average CSC performance

was $2\frac{1}{2}$ points or more poorer than would be expected from the average JSLE mark of the intake. These schools were classified as being of low quality.

- (c) The plots for the remaining eight schools clustered fairly closely around the CSC regression line, indicating that average CSC performance was about as good as would be expected from the average JSLE mark. These schools were classified as being of medium quality.

It is interesting to note that only three senior schools would have been classified differently if we had simply taken the mean CSC grade aggregate for each school as our criterion of quality, with cutoff points $2\frac{1}{2}$ marks above and below the sample mean. This is because, as we have already seen (Chapter III), pupils who enter the most selective schools tend to show the most improvement in performance.

Senior secondary quality was then correlated with junior secondary quality. There was a clear tendency for the two variables to be positively associated: that is, boys from high-quality junior schools tended to be accepted by high-quality senior schools, and boys from low-quality junior schools by low-quality senior schools. But this was due entirely to the fact that boys from high-quality schools have, on the average, higher JSLE marks. When JSLE mark was held constant, the differences disappeared completely. Hence a pupil from a poor junior school has just as good a chance of entering a high-quality senior school as a pupil from a good junior school, if he has the same JSLE marks. Several of the most successful senior schools showed, in fact, a marked preference for pupils from low-quality junior schools, particularly when selecting among borderline candidates. There is thus no evidence to support the hypothesis that the failure of boys from low-quality junior secondary schools to improve their relative academic status while at senior secondary school is due to their receiving, on the average, poorer secondary education than boys from high-quality schools with similar selection exam

marks.¹

Let us briefly recapitulate the argument so far:

1. The average mark obtained by different schools in the JSLE varies widely. To some extent the variations in exam performance are due to differences in the pupils, but differences in school quality are probably more important.
2. Hence the mark a pupil will obtain in the JSLE largely depends on the quality of the school he enters. If he enters a high-quality school his mark is likely to be much better than if he enters a low-quality school, probably by as much as one standard deviation, regardless of his ability.
3. It should thus follow that when pupils with similar JSLE marks are compared, those from low-quality schools will have better academic potential than those from high-quality schools.
4. Given similar marks in the JSLE, there is no difference in the quality of the senior secondary education received by pupils from high-quality and low-quality junior secondary schools. Hence it might be anticipated that after four years senior secondary schooling, pupils from low-quality junior schools, with their unexploited intellectual ability, would achieve better school certificate results than boys with the same JSLE marks from more successful junior schools. This expected result, however, was not found. With JSLE mark held constant, there was no difference in the CSC performance of boys from high-quality and low-quality junior schools, except among those

¹ For a reason that is not clear, medium quality senior schools show quite a marked tendency to prefer pupils from the more successful junior schools, in contrast to both the high quality and the low quality senior schools. This should not have any systematic effect on the relationships being investigated.

with the very highest JSLE marks. That is, pupils who had received poor elementary education, and whose JSLE performance was therefore below the level they were capable of, failed to make good their handicap when they went on to senior secondary school.

One conclusion suggested by these results is that tests of intellectual aptitude may have little validity as predictors of senior secondary performance. This does not necessarily follow from the observed patterns, however. The relationships among JSLE total mark, CSC grade aggregate, JSS quality, and measured aptitude are likely to be complex, and until data are available on all four variables from the same sample it will not be possible to untangle them.¹ Studies in Britain have repeatedly shown that aptitude tests taken as part of the eleven-plus selection examination are better predictors of subsequent grammar school performance than achievement tests, and it is difficult to see reasons why the results should be different in an African sample. Until we have a direct measure of the relationship between aptitude test scores at JSLE level and school certificate performance four years later the question must remain an open one.

¹ If measured aptitude did prove to be a good predictor of CSC performance, the relationship pattern among CSC grade aggregate, JSS quality, and measured aptitude would be as follows, JSLE total mark held constant:

	<u>JSS quality</u>	<u>Aptitude test score</u>
CSC grade aggregate	0	+
JSS quality		-

Such a pattern is quite possible; in fact, in another study, of factors affecting JSLE performance, a relationship pattern which seemed even more inconsistent was found. (Somerset, 1965, pp. 9-12). In order to explain the former pattern, however, it would be necessary to examine the nature of the variance shared by the aptitude test with CSC grade aggregate on the one hand, and with JSS quality on the other.

The evidence for the second conclusion is much more compelling. The results suggest strongly that the effects of inferior education at the primary and junior secondary levels are largely irreversible. The relative performance of many pupils from poor schools does, of course, improve between the selection examination and school certificate, but this improvement is just as likely to occur if the pupil comes from a superior school. Hence, when we are considering the average performance of groups rather than the specific performance of individuals, it seems that the quality of the instruction pupils have received in their first eight years of schooling sets a limit to the level they will reach in the school certificate examination. Pupils who have learned to use their intellectual capacities effectively during their first years at school generally continue to do so as they progress through the educational system, whereas those who start senior secondary school with a handicap of eight years' inferior education usually fail to make up the leeway.¹

It is difficult to estimate the likely effects of poor elementary education on the quality of school certificate output, because we do not know to what extent the JSS quality scores are contaminated by non-quality factors, but at a very rough guess it seems probable that if the teaching in the low-quality schools has been as effective as it was in the medium-quality schools, the average school certificate performance of pupils from poor junior schools would have been at least 4 or 5 grade aggregate points better. Such an improvement would have had a substantial effect on the overall school certificate results, particularly on the numbers gaining first class certificates.

It should be remembered, too, that the JSS quality classifications we have used are relative to this sample only. Even among the schools we classified as being of "high quality", probably only a few would compare favourably in standards of teaching and equipment with typical elementary schools in developed countries. If, as our results suggest, the quality of elementary schooling has permanent effects on subsequent educational attainment, most Uganda pupils taking

¹ Almost exactly the same result was found among the girls. (See Chapter VI).

secondary school courses are likely to be at a considerable disadvantage compared with pupils taking similar courses in, say, Britain or America. There may thus be tremendous scope for improving high level educational attainment through providing better elementary education.

In a country such as Uganda, where there is an acute shortage of well-qualified elementary teachers, it is to be expected that there will be wide variations in teaching efficiency from school to school. It is noticeable, however, that the schools with the best-qualified teachers are by no means always the most successful. Other factors, such as commitment and enthusiasm, are probably more important. Without a full-scale study it would be impossible to document the significance of these less tangible qualities, but their effects can be seen in many aspects of the school programme. For example, in a number of the schools visited while collecting research data for another project it was found that virtually no use was made of the school library. The books were often kept in a locked cupboard, and borrowings per pupil averaged only one or two per annum. Most of these libraries were ill-equipped, and in some the stock consisted mostly of obsolete textbooks. But lack of money to buy books was not always the reason for poor standards. One school had received a box of new books six months previously which had not yet been unpacked. In other schools, by contrast, the library was in constant use, and borrowings ranged up to 15 and 20 books per pupil per annum. In one of the most successful (although non-selective) schools, the library contained several thousand books, mostly simplified English readers, and on both days of our visit there were long queues of pupils waiting to change books after school hours. Although this school was in one of the most isolated areas of Uganda, the library subscribed to the Kampala English language newspaper.

Similar differences can be seen in the use schools make of the school garden, and of equipment for science and physical education. Some schools have quite elaborate collections of scientific apparatus which are obviously never used, while other schools carry out a full programme of simple scientific experiments, often with modest equipment. In one school an enthusiastic teacher had constructed a comprehensive set of playground equipment, including a

climbing frame, horizontal bars, and swings, using local timbers. The equipment was in regular use, both during physical education classes and in play periods. On our second visit a year later, however, the teacher had left and the equipment had been dismantled.

One factor which, perhaps more than any other, tends to determine the quality of a school is the efficiency of its headmaster. During our school visits it was noticeable that where a headmaster was competent, and had a sense of involvement in doing his job well, this was reflected in most aspects of the school's work. The morale of the assistant teachers and pupils was usually high, the school garden and library were usually well run, the school meal tended to be nutritious and well prepared, and examination results were usually good. If, on the other hand, the headmaster was inefficient and lacking in concern for the progress of his pupils, the school and grounds tended to have a generally run-down appearance, pupils and teachers were often absent from their classes, and examination results were usually poor. These effects were particularly noticeable in areas where visits from education officers and inspectors were infrequent.

Although our results were unexpected, they are, in fact, consistent with a growing body of evidence from investigations carried out in recent years. Workers such as Hebb (1949), Ferguson (1954), Hunt (1961) and Bloom (1964), have argued that the variety and quality of the environment provided for children or young animals largely determines their ability to learn in later years. In Harlow's (1949) phrase, the young individual must "learn how to learn"; he must learn how to cope with new situations quickly and efficiently. In other words, he must learn how to behave intelligently. The more varied and complex the situations likely to be encountered in adult life, the more important it is that the growing individual develop a wide repertoire of coping responses.

In an experiment described by Hebb (1949, pp. 298-299), for example, the maze learning ability of white rats reared as pets and rats reared in laboratory cages was compared. He found that the pet group, which had had experience of a wider environment

during development, not only scored higher than the cage reared group in the initial testing (which might have been due to their being tamer and more used to handling), but also learned more quickly as the testing continued. The animals which had been reared in the richer and more complex environment were more efficient at problem solving as adults than those reared in the restricted environment. In a later experiment Hymovitch (1952) demonstrated that the younger the rats are when they experience the more favourable environment, the more marked is the improvement in adult learning.

The relevance of these and similar findings for our understanding of the development of human ability is still in dispute. Many workers continue to stress the importance of genetic factors (e.g. Kallman, 1953; Burt and Howard, 1956). Nevertheless the evidence that adult learning skills can be improved by bettering the environment in which children are reared has led Havighurst (1961) to suggest tentatively that "the production of mentally superior people is more a matter of social engineering than of the discovery and exploitation of a rare natural resource".

Under what circumstances, then, are children most likely to develop effective learning skills? One important condition suggested by the results we have discussed is that their environment should present them with a series of varied and challenging materials and experiences. But more than this is needed. Children should be encouraged to develop an active, exploratory approach to this environment, so that they learn to discover and exploit its potentialities largely through their own efforts. Further, (perhaps this follows automatically from the previous conditions) learning should be enjoyable, so that the gaining of competence and knowledge comes to be seen as desirable for its own sake, rather than as simply a means of passing examinations or avoiding punishment. Bertrand Russell summed this up perhaps better than anyone else when he wrote (1926, p. 203): "Throughout education, from the first day to the last, there should be a sense of intellectual adventure. The world is full of puzzling things which can be understood by sufficient effort. The sense of understanding what had been puzzling is exhilarating and delightful; every good

teacher should be able to give it Few joys are so pure or so useful as this".

Before they begin school, many children will have already started to develop these desirable attitudes and approaches to intellectual experience, because of the help they get from their home environment. Others, particularly from the lower socioeconomic groups, will have developed attitudes less conducive to intellectual growth. For these less favoured children particularly, the nature of the early contact with formal education is likely to be critical in determining whether they "learn how to learn" effectively. The American programme "Operation Head-start" is based on the assumption that the poor educational performance of children from under-privileged families is due more to the intellectual impoverishment of their out-of-school experience than to deficiencies in intellectual potential. The programme aims to compensate for this handicap by providing such children with opportunities for satisfying and varied intellectual experience in nursery and infant classes. The African child from a low income family will probably be much more highly motivated to succeed than his American counterpart, but for both the contrast between home and school is likely to be abrupt, and for both, educational success is likely to depend heavily on the quality of the school environment and the skill of the teachers.

The data presented in this chapter have policy implications. In Uganda, as in most newly independent African nations, it has been necessary to give the highest priority to expanding secondary and university education, in order to train Uganda citizens in sufficient numbers to take over professional and administrative jobs from expatriates, and to provide a basis for economic development. The number of entrants to senior secondary courses rose from about 2,000 in 1960 to over 6,000 in 1965, and by 1971 should reach nearly 8,000. The intake into higher senior secondary (post-school certificate) courses has increased even more sharply: from 118 in 1960 to 575 in 1965, and a projected 900 in 1971.

This rapid expansion is, of course, essential to Uganda's economic growth. To some extent

however, it has necessarily been achieved at the cost of slower development of the elementary system. It is probably true that the quality of senior secondary education provided in Uganda is, on the average, at least as good as it is in most developed countries. It is certainly true that undergraduate university education is better than it is in many developed countries. Elementary education, on the other hand, is inferior. Most teachers in Uganda's aided primary and junior secondary schools have been trained, but only a quarter of the men and less than a quarter of the women reached JSLE level or higher before starting their training (Uganda Education Statistics, 1965, Table A7). Moreover, because of the need to prepare pupils for the primary and junior secondary leaving examinations, most of the better qualified teachers are concentrated in the upper primary and junior secondary classes. The youngest children are thus usually taught by the teachers with the lowest qualifications. This is often justified by arguing that because the material to be learned in the first few years at school is simple, it can be taught satisfactorily by teachers whose own education did not continue past primary level. Children in infant and junior primary classes, however, are not only learning how to read and write, but they are also learning basic attitudes to intellectual experience, which, we have argued, may be crucial for the development of efficient learning at secondary school and later. If this is the case, infant teachers need to be at least as skilled as those teaching older children.

It is not, of course, meant to imply that an under-qualified teacher is necessarily a poor teacher. Some of the most skilful and enthusiastic teachers the writer has met were among those with low formal qualifications who had had the opportunity to attend in-service refresher courses. A great deal could be done to improve the quality of the elementary teaching force by providing more such courses. A teacher with classroom experience is likely to benefit more from training in teaching methods than a pupil straight from school, but perhaps more important than this is the effect in-service training can have on morale and professional commitment. Many teachers, particularly in the more remote areas, complain that after they finish their basic training they receive little further professional advice and encouragement. They often feel that their services are not valued, and that there is

little incentive for them to try to improve their teaching skills. This sense of professional isolation probably contributes as much to poor teaching standards in Uganda's elementary schools as any other single factor.

The quality of education available to children in their early school years is reduced further in some areas by the shortage of places in aided primary schools. In these areas large numbers of privately run "nursery" schools have often sprung up, to prepare children for entry to primary school. The teachers are nearly always unqualified, and, with some notable exceptions, standards are very low. At least a few primary school headmasters have found it necessary to conduct informal selection examinations to choose among the large number of applicants from these schools.

Elementary schools are for the most part inadequately equipped as well as poorly staffed. A few teachers, particularly some of those who have attended refresher courses, show imagination and resourcefulness in using locally available materials,¹ but in general, primary schools fail to provide children with the opportunity to explore and exploit the potentialities of a varied and intellectually challenging environment, and thus to develop a wide repertoire of effective approaches to problem situations.

If children were given this positive kind of intellectual experience during their early years at school, they might not only "learn how to learn" more efficiently, but they might also be more likely to provide impetus to social change and innovation when

¹ Such as bottle tops or large seeds for number work, newspaper and magazine cuttings for reading, and clay and banana fibre for the development of manipulative and perceptual skills. In another study it has been shown that junior secondary pupils from poorly equipped schools often have difficulties with pictorial perception, and that this is frequently associated with poor performance in the junior secondary leaving examination. (Somerset, 1964, p. 6, preliminary results only).

they leave school. Whether they continue with their education past elementary level or not, pupils who have been encouraged to seek solutions to problems and to explore for themselves the possibilities of situations will probably be more receptive to new ideas and ways of doing things than pupils who have been taught simply to remember information passively received and to reproduce it accurately in examinations. At the moment educational development planning is mainly concerned with the numbers of pupils reaching the various attainment levels, from completion of the primary course to university graduation, but the possibility that the contribution of education to economic and social development is determined as much by what kind of education children receive as by how much they receive should not be overlooked.

It is sometimes argued in support of the present policy of giving lower priority to elementary school development than to secondary school and university development that senior secondary entrance is already highly selective, and that more than enough junior secondary leavers with the capacity to pass school certificate are available. Implicit in this argument is the assumption that, provided the senior secondary entrants are up to a certain minimum standard and have the necessary intellectual potential, any shortcomings resulting from deficiencies in their elementary education can be made good at secondary school. Our findings, however, suggest strongly that this is not so. If a pupil is to reach a standard of attainment in school certificate close to the best of which he is capable, he must receive good education throughout his school career. Superior education at the secondary level cannot compensate for inferior elementary education.

If these findings are valid, they have relevance for educational development planning. They indicate that investment in the improvement of elementary education is likely to give rise to benefits consisting not only of better attainment among primary and junior secondary pupils, but also of better performance in the school certificate examination and perhaps also at higher levels. No matter how selective the senior entrance examination may be, the returns to any given level of investment in secondary education will to some extent depend on the level of investment

in elementary education. This will be particularly apparent when the elementary school system is markedly inferior to the secondary system, as it is in Uganda and most other developing countries.

For the moment, the bias in favour of secondary school development is justified by Uganda's immediate manpower needs. The elementary school system, despite its weaknesses, is certainly good enough to produce large numbers of pupils capable of achieving adequate school certificate passes after another four years education. Our results suggest, however, that many more pupils would have achieved really outstanding results if they had received better elementary education. In the long term Uganda, like every other nation, must be concerned to provide the conditions under which pupils of exceptional mental calibre have the opportunity to develop their potential fully, and ultimately to reach the highest levels of intellectual attainment. While the discrepancy between the quality of elementary and higher education remains so marked, it seems unlikely that this goal will be achieved for more than a minority of such pupils. The fact that, despite the handicaps, so many pupils do achieve outstanding results in school certificate and higher examinations is impressive evidence of the intellectual potential which remains so far unexploited in Uganda's school age population.